In The Claims

1. (ORIGINAL) A polarization dependent device suitable for effecting at least one polarization of a broadband portion of electromagnetic radiation incident upon the device, said device comprising:

a substrate; and,

a plurality of regions of differing refractive indices positioned in an alternating manner and substantially adjacent to said substrate to effect the at least one polarization impinging on the regions,

wherein said plurality of regions are oriented with respect to the at least one polarization of the broadband portion of the electromagnetic radiation so as to effect the at least one polarization of the broadband portion of the electromagnetic radiation impinging on said regions.

2. (ORIGINAL) The device of claim 1, further comprising a layer positioned substantially adjacent to said substrate distal to said plurality of regions, wherein said layer is suitable for enhancing transmission characteristics of the device.

3. (ORIGINAL) The device of Claim 2, wherein said layer enhances transmission by reducing unwanted reflections.

4. (ORIGINAL) The device of Claim 3, wherein said layer includes at least one material selected from the group consisting of SiO2 and HFO2.

5. (ORIGINAL) The device of Claim 1, wherein said substrate comprises at least one of glass, semiconductors, Faraday magnetic optic materials, and polymers.

6. (ORIGINAL) The device of Claim 5, wherein said Faraday magnetic optic materials comprises at least one material including at least one element selected from the group consisting of bismuth, iron, gallium and oxygen.

7. (ORIGINAL) The device of Claim 5, wherein said Faraday magnetic optic materials comprises at least one of garnet and Faraday magnetic optic crystals.

8. (ORIGINAL) The device of Claim 1, wherein said plurality of regions have a width in the range of 10 to 500 nm.

9. (ORIGINAL) The device of Claim 8, wherein said plurality of regions have a width in the range of 15 to 180 nm.

10. (ORIGINAL) The device of Claim 1, wherein said plurality of regions have a height in the range of 10 to 1000 nm.

11. (ORIGINAL) The device of Claim 10, wherein said plurality of regions have a height in the range of 30 to 500 nm.

12. (ORIGINAL) The device of Claim 1, wherein said plurality of regions have a period in the range of 10 to 1000 nm.

13. (ORIGINAL) The device of Claim 12, wherein said plurality of regions have a period in the range of 30 to 200 nm.

14. (ORIGINAL) The device of Claim 1, wherein the first refractive indices of said plurality of regions of differing refractive indices includes a conductive material.

15. (ORIGINAL) The device of Claim 14, wherein said conductive material includes at least one material selected from aluminum, gold, silver, and copper.

16. (ORIGINAL) The device of Claim 1, wherein the first refractive index of said plurality of regions of differing refractive indices includes an alloy.

17. (ORIGINAL) The device of Claim 1, wherein the second refractive index of said plurality of regions of differing refractive indices includes a material selected from the group consisting of air, vacuum, and a dielectric material.

18. (ORIGINAL) The device of Claim 17, wherein said dielectric material includes at least one of inorganic liquid, organic liquid, silicon dioxide, metal oxide, metal fluoride and organic polymer.

19. (ORIGINAL) The device of Claim 18, wherein said organic polymer includes a hydrocarbon.

20. (ORIGINAL) The device of Claim 1, wherein said device effects the at least one polarization of electromagnetic radiation incident upon the device by beamsplitting.

21. (ORIGINAL) The device of Claim 1, wherein said device effects the at least one polarization of electromagnetic radiation incident upon the device by beam combining.

22. (ORIGINAL) The device of Claim 1, wherein said device effects the at least one polarization of electromagnetic radiation incident upon the device by absorbing the radiation.

23. (ORIGINAL) The device of Claim 1, wherein said device effects the at least one polarization of electromagnetic radiation incident upon the device by reflecting the radiation.

24. (ORIGINAL) The device of Claim 1, wherein said plurality of regions include dimensions that vary.

25. (ORIGINAL) The device of Claim 1, wherein said plurality of regions include dimensions that are chirped.

26. (ORIGINAL) The device of Claim 1, further comprising a dielectric layer positioned substantially about the device.

27. (ORIGINAL) The device of Claim 26, wherein said dielectric layer has a thickness in the range of 1 nm to 50 nm.

28. (ORIGINAL) The device of Claim 26, wherein said dielectric layer comprises at least one of silicon dioxide, organic polymer, silicon nitride, silicon oxynitride, magnesium fluoride and metal oxide.

29. (ORIGINAL) The device of Claim 26, wherein said dielectric layer is suitable for improving the reliability of the device.

30. (ORIGINAL) The device of Claim 1, further comprising at least one thin film positioned substantially adjacent to said plurality of regions.

31. (ORIGINAL) The device of Claim 30, wherein said at least one thin film operates as an etch stop.

32. (ORIGINAL) The device of Claim 1, wherein said plurality of regions of differing refractive indices positioned in an alternating manner comprises alternating materials of low and high refractive index.

33. (ORIGINAL) The device of Claim 32, wherein said high index material comprises at least one of aluminum, gold, silver, copper, and alloys.

34. (ORIGINAL) The device of Claim 32, wherein said low index material comprises air.

35. (ORIGINAL) The device of Claim 32, wherein said low index material comprises a vacuum.

36. (ORIGINAL) The device of Claim 32, wherein said low index material comprises a filler material.

37. (ORIGINAL) The device of Claim 32, wherein said low index material comprises dielectric material.

38. (ORIGINAL) The device of Claim 1, wherein said device has an extinction ratio greater than approximately 100 in transmission over a wavelength range of 390 nm to 1650 nm.

39. (ORIGINAL) The device of Claim 1, wherein said device has a transmittance greater than 0.50 over a wavelength range of 390 nm to 1650 nm.

40. (ORIGINAL) The device of Claim 1, further comprising an intermediate dielectric layer positioned substantially between and adjacent to said substrate and said plurality of regions.

41. (ORIGINAL) The device of Claim 40, wherein said intermediate dielectric layer comprises at least one of silicon dioxide, metal oxide and organic polymer.

42. (ORIGINAL) The device of Claim 41, wherein said organic polymer comprises hydrocarbon.

43. (ORIGINAL) A polarization dependent device suitable for effecting at least one polarization of broadband electromagnetic radiation incident upon the device, said device comprising:

a substrate;

a plurality of regions of differing refractive indices positioned in an alternating manner and substantially adjacent to said substrate to effect the at least one polarization impinging on said regions;

at least one anti-reflection coating positioned substantially adjacent to said substrate distal to said pattern;

an intermediate dielectric layer positioned substantially between and adjacent to said substrate and said pattern of nanostructures; and,

a dielectric layer positioned substantially about the device.

44. (ORIGINAL) The device of Claim 43, wherein said plurality of regions are oriented with respect to the at least one polarization of broadband electromagnetic radiation so as to effect the at least one polarization of broadband electromagnetic radiation impinging on said regions.

45. (ORIGINAL) The device of Claim 43, wherein said at least one anti-reflection coating enhances transmission by reducing unwanted reflections.

46. (ORIGINAL) The device of Claim 43, wherein said device effects the at least one polarization of broadband electromagnetic radiation incident upon the device by at least one of beamsplitting, beam combining, absorbing and reflecting the radiation.

47. (ORIGINAL) The device of Claim 43, wherein said plurality of index regions of differing refractive indices positioned in an alternating manner comprises alternating materials of low and high index.

48. (ORIGINAL) The device of Claim 43, wherein said device has an extinction ratio greater than approximately 100 in transmission over a wavelength range of 390 nm to 1650 nm.

49. (ORIGINAL) The device of Claim 43, wherein said device has a transmittance greater than 0.50 over a wavelength range of 390 nm to 1650 nm.

50. (ORIGINAL) A polarization dependent device suitable for effecting at least one polarization of a broadband portion of electromagnetic radiation incident upon the device, said device comprising:

a substrate; and,

a plurality of regions of differing refractive indices positioned in an alternating manner and substantially adjacent to said substrate to effect the at least one polarization impinging on the regions,

wherein said device has an extinction ratio greater than approximately 100 in transmission over a wavelength range of 390 nm to 1650 nm, and

wherein said device has a transmittance greater than 0.50 over a wavelength range of 390 nm to 1650 nm.

51. (ORIGINAL) The device of Claim 50, wherein said plurality of regions are oriented with respect to the at least one polarization of the broadband portion of the electromagnetic radiation so as to effect the at least one polarization of the broadband portion of the electromagnetic radiation impinging on said regions.

52. (ORIGINAL) A polarization dependent device suitable for effecting at least one polarization of broadband electromagnetic radiation incident upon the device, said device comprising:

a substrate;

a plurality of regions of differing refractive indices positioned in an alternating manner and substantially adjacent to said substrate to effect the at least one polarization impinging on said regions;

at least one anti-reflection coating positioned substantially adjacent to said substrate distal to said plurality of regions;

at least one intermediate dielectric layer positioned substantially between and adjacent to said substrate and said plurality of regions; and,

at least one anti-reflection coating layer positioned substantially adjacent to said plurality of regions and distal to said substrate,

wherein said device has an extinction ratio greater than approximately 5000 in transmission over a wavelength range of 1250 nm to 1350 nm, and

wherein said device has a transmittance greater than 0.96 over a wavelength range of 1250 nm to 1350 nm.

53. (ORIGINAL) The device of Claim 52, wherein said plurality of regions is oriented with respect to the at least one polarization of broadband electromagnetic radiation so as to effect the at least one polarization of broadband electromagnetic radiation impinging on said regions.

54. (ORIGINAL) A polarization dependent device suitable for effecting at least one polarization of broadband electromagnetic radiation incident upon the device, said device comprising:

a substrate;

a plurality of regions of differing refractive indices positioned in an alternating manner and substantially adjacent to said substrate to effect the at least one polarization impinging on said regions;

at least one anti-reflection coating positioned substantially adjacent to said substrate distal to said plurality of regions;

at least one intermediate dielectric layer positioned substantially between and adjacent to said substrate and said plurality of regions; and,

at least one anti-reflection coating layer positioned substantially adjacent to said plurality of regions and distal to said substrate,

wherein said device has an extinction ratio greater than approximately 5000 in transmission over a wavelength range of 1450 nm to 1650 nm, and

wherein said device has a transmittance greater than 0.96 over a wavelength range of 1450 nm to 1650 nm.

55. (ORIGINAL) The device of Claim 54, wherein said plurality of regions is oriented with respect to the at least one polarization of broadband electromagnetic radiation so as to effect the at least one polarization of broadband electromagnetic radiation impinging on said regions.